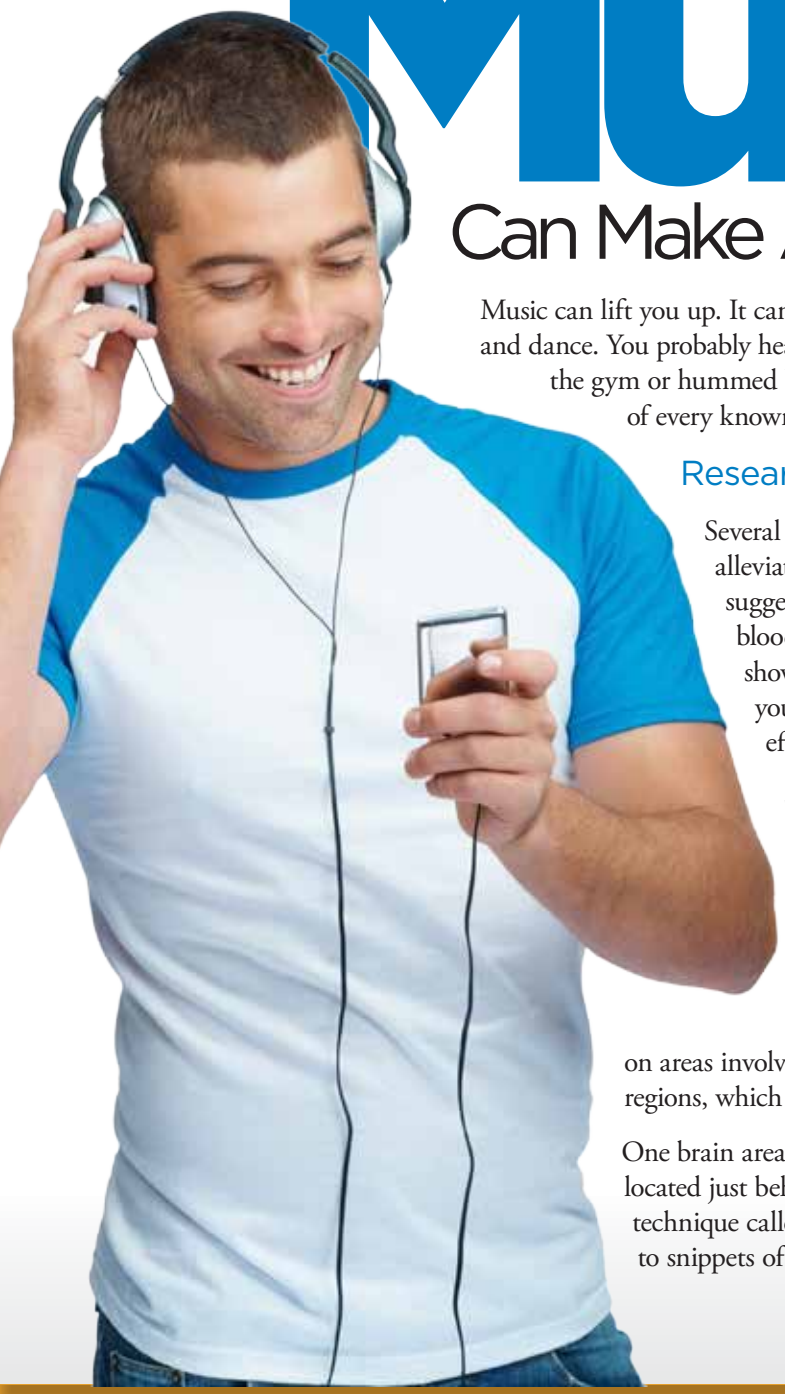
WELCOA
ONLINE BULLETINS

To Your HEALTH

WELCOA'S ONLINE GENERAL WELLNESS BULLETIN

Music Can Make A Difference...



Music can lift you up. It can bring tears to your eyes. It can help you relax or make you get up and dance. You probably hear it several times a day—on the radio or TV, in the supermarket, at the gym or hummed by a passerby. Music's been with us since ancient times, and it's part of every known culture. Music strikes a chord with all of us.

Research You'll Like to Hear

Several well-controlled studies have found that listening to music can alleviate pain or reduce the need for pain medications. Other research suggests that music can benefit heart disease patients by reducing their blood pressure, heart rate and anxiety. Music therapy has also been shown to lift the spirits of patients with depression. Making music yourself—either playing instruments or singing—can have therapeutic effects as well.

Scientists have long known that when music and other sounds enter the ear, they're converted to electrical signals. The signals travel up the **auditory** nerve to the brain's auditory cortex, which processes sound. From there, the brain's responses to music become much more complex.

Over the past decade, new brain imaging techniques have shown that music activates many unexpected brain regions. It can turn on areas involved in emotion and memory. It can also activate the brain's motor regions, which prepare for and coordinate physical movement.

One brain area that's drawn interest in recent years is the medial prefrontal cortex, located just behind the eyes. In a recent study, researchers used an imaging technique called fMRI to look at the brains of young adults while they listened to snippets of songs from their childhoods. When they heard familiar songs, the

CONTINUED ON NEXT PAGE

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(Continued from previous page)

medial prefrontal cortex lit up. Activation was strongest when the song evoked a specific memory or emotion.

The medial prefrontal cortex also seems to play a role in the creative expression of music. Dr. Allen Braun, a scientist at NIH's National Institute on Deafness and Other Communication Disorders (NIDCD), and Dr. Charles Limb of Johns Hopkins University asked jazz musicians to play music on a keyboard inside an MRI scanner. When improvising, the musicians' medial prefrontal cortex turned on. But the region wasn't activated when they were playing memorized scales.

Can Music Make Us Healthy?

Although research affirming the health benefits of listening to music is promising, unfortunately, for some people listening to music can be an unpleasant challenge. About 1 in 50 people have a disorder called tune deafness. They have trouble hearing the differences between musical tones. They can't carry a tune.

"The most severely affected people can't even recognize it as music. To them it just sounds like traffic noise," says geneticist Dr. Dennis Drayna of NIDCD. Nearly 10 years ago, he and his colleagues studied twins and showed that both tune deafness and perfect pitch are inherited.

"People with tune deafness can pass a standard hearing test with flying colors, but something we don't yet understand is drastically wrong with their auditory system," he says.

A new clue came from a recent brain imaging study by Drayna and Braun. When a familiar tune hit a sour note, brain scans unexpectedly showed that tune deaf people registered the mistake, similar to people with normal hearing. However, the tune deaf people somehow didn't realize they'd heard a mistake. Their brains failed to produce a second signal that occurs when the brain doesn't hear what it expects.

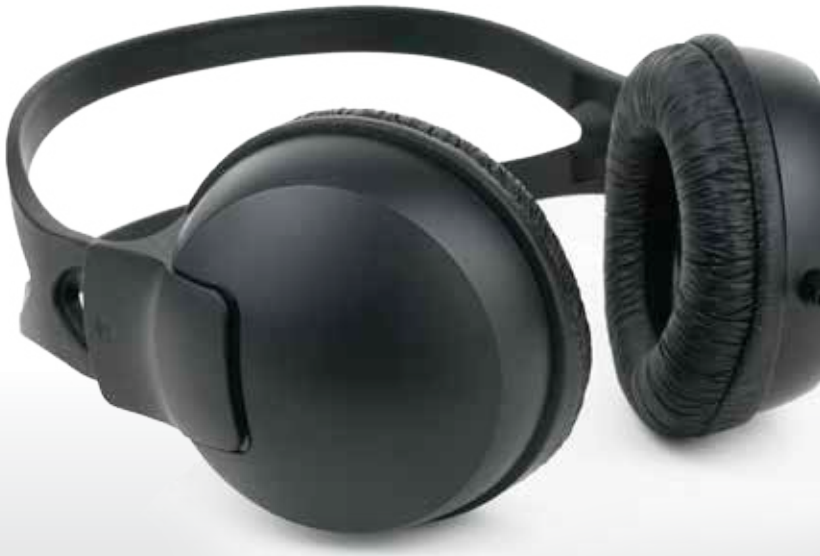
"Somehow, the melodic structure of the music is processed unconsciously by these people, but they can't consciously recognize the errors," says Braun. Some researchers suspect that the brain processing errors that lead to tune deafness may also be at play in some learning and developmental disorders.

Scientists continue to explore the relationship between music and health. While they search, try turning on the radio or grabbing your guitar. Enjoy whatever music brings your way.

Musical Activities

Research suggests that music may help with pain, Alzheimer's disease and other medical conditions. Try the following activities:

- Play CDs, tapes or records.
- Attend a concert or musical program.
- Talk about the music, the singer or the memories the songs bring up.
- For those who play instruments, get together and play with friends and family.
- Sing or dance along together.
- Play musical games like "Name That Tune."



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